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Astrometric microlensing with the Gaia satellite

We consider a possibility of simultaneous observation of microlensing events by the Gaia mission from space and the OGLE project from the ground. We simulate realistic astrometric time-series of Gaia measurements and combine it with the photometry of an archival event, OGLE3-ULENS-PAR-02, which is a likely galactic black hole. We predict that at the end of the Gaia mission the lenses heavier than 10 solar masses will have their masses derived with accuracy between a few to 15 per cent with the degeneracy between the solutions broken. We explore the limitations of the method and find that only events brighter than  $G < 16$  mag at the baseline will have the masses determined accurately, however, fainter events ( $G < 18$ ) can still be used for lenses heavier than 30 solar masses.